

BENHS INDOOR MEETINGS

28 January 1992

The President, Mr A. J. HALSTEAD showed two pests of pyracantha. The woolly aphid *Eriosoma lanigerum* (Hausman) (Homoptera: Pemphigidae) is usually thought of as a pest of apple trees, but it also infests ornamental plants in the Rosaceae, including pyracantha and cotoneaster. Chemicals secreted by the aphids as they feed induce knobbly swellings to develop in the stems, easily seen in the winter months.

Also present on the bark were the overwintering nymphs and the remains of last summer's adults of the brown scale, *Parthenolecanium corni* (Bouche) (Homoptera: Coccidae). The upper surfaces of the leaves were covered with non-parasitic moulds which develop on the sugary honeydew excreted by the brown scale and other sap-feeding insects.

The Secretary, Dr J. MUGGLETON, drew members' attention to the recent annual meeting notice on which the position of Secretary of the Society was advertised as being vacant. He appealed for any member who thought they might be able to fill this important position to come forward.

Despite a power failure to the Royal Entomological Society's building, the lecturer, Dr J. W. DOVER of Liverpool bravely resolved to deliver his lecture on 'Butterfly ecology on arable farmland' through the unearthly din and belching exhaust fumes of the petrol-driven generator which was providing power for the lighting. Unable to use the slide projector, he urged his audience to imagine the spectacular slides he had brought with him.

Dr Dover had carried out his studies of butterflies on arable land as part of the research of the Game Conservancy Trust. In not spraying the outer 6 m of arable fields (headlands) with the usual cocktail of insecticides, fungicides and fertilizers, farmers participating in the project encouraged the growth of a wide variety of arable 'weeds' in the band surrounding the fields. By comparing these field edges with others which had been extensively sprayed, he was able to compare the butterfly faunas and examine which important aspects of field structure determine butterfly abundance and activity.

Compared to sprayed areas, the conservation headlands had three times as many butterflies; there were more species and more specimens. Looking at butterfly activities, the flowery conservation headlands attracted far more butterflies to feed, bask, mate and egg-lay, where butterflies simply tended to fly past the rather barren sprayed field edges.

The flower-visiting activities of the butterflies varied with the season. In spring they visited the charlock, an adventitious species of disturbed ground which grew in yellow swathes along the unsprayed headlands. Later on in the year they tended to visit the brambles, thistles and clematis flowers in the bordering hedgerows, an indication that the hedgerows were escaping much of the drift of the sprays which would ordinarily be applied near to the field margins.

Using mark and recapture techniques, Mr Dover was able to study colony structures in the gatekeeper and meadow brown. Confirming expectations, the meadow brown showed some movement of individuals. Of 368 marked specimens, 16% had moved to a neighbouring area, but only 9% had moved further. Males tended to move further (average 500 m) than females (average 350 m) and a few males flew more than 2 km. The gatekeeper showed much less movement. Of 325 marked, only 5% had moved to a neighbouring area. A very few males moved more than 1 km, but the furthest female was found only 300 m away.

Clematis was found to discourage nearby colonies. Despite the obviously attractive flowers, it tended to smother food plants and other nectar sources. Along with the availability of nectar and food-plants, available shelter played an important role in determining the position of colonies and the tendencies of the butterflies to move. [Readers are referred to Dover, J. W., Clarke, S. A. & Raw, L. 1992. Habitats and movement patterns of satyrid butterflies (Lepidoptera: Satyridae) on arable farmland. *Entomologist's Gazette* 43: 29-44, for further information on this topic.]

11 February 1992

The President announced the deaths of two members: Mr I. C. Christie, who joined the Society in 1981, and Mr R. E. Stockley, who although not a member in recent years, joined the Society in 1955.

The President showed a male of the horse bot fly, *Gasterophilus intestinalis* (Deg.), taken 4.viii.87 on Dunkery Hill, Exmoor, Somerset. The fly was found resting on a cairn built on the hill top. Females lay eggs on the skin and hairs of horses and donkeys, especially on the fore legs and belly. The eggs are stimulated to hatch by friction when licked by the horse. The larvae eventually reach the stomach where they attach themselves to the stomach lining. After 9-10 months, the maggots release their hold and are passed with the faeces to pupate in the ground. Although the maggots are reported to cause little direct harm, horses can become very agitated when they hear the high-pitched whining tone made by the hovering females as they oviposit.

Mr R. A. JONES showed three true ants and a velvet ant from Costa Rica, Central America. There is a common misconception that all tropical insects are huge. Certainly there are plenty of large species, but there is also an inordinate number of minute ones too. A giant leaf-cutter ant at 15.5 mm was 12½ times as long as tiny 'pharaoh' ants at 1.25 mm, and approaching 2000 times as massive. A golden ant was covered with delicate pruinose pubescence. The velvet ant, from Carera on the Pacific coast was also patterned with spots of golden pubescence.

Mr R. A. SOFTLY showed three specimens of the chestnut, *Conistra vaccinii* (L.) taken at his light trap near Hampstead Heath on the night of 4.ii.92, indicating that the recent mild weather had dislodged the first of the hibernators from their overwintering sites.

The name of Paul Barrett was read for the second time, and he was duly elected a member of the Society.

Mr P. J. CHANDLER announced that it was hoped building would start on the Society's new headquarters at Dinton Pastures in about two weeks' time.

The Secretary, Dr J. MUGGLETON announced that Mr R. F. McCormick had accepted the position of Secretary of the Society, the post having been announced as 'vacant' on the recent Annual Meeting notice.

Dr M. HALL of the Natural History Museum delivered his lecture entitled 'Invasion of the man-eating maggots'. The maggot in question was the New World screw-worm, *Cochliomyia hominivorax* (Coquerel) an obligate parasite of vertebrates, the larva of which feeds on living flesh, including that of Man.

It was originally described in the mid-nineteenth century from maggots attacking convicts in Cayenne, French Guyana, and by the 1950s was widespread across much of the USA, Mexico, Central and South America. Recent eradication programmes have now rid the USA and Mexico of this horrible fly.

The females are attracted by the odours of a wound and the eggs are laid in a single mass at the edge. The maggots burrow into the flesh, using specially adapted rings

of spines to prevent being rubbed or shaken off. After three larval stages, the maggots drop to the ground to pupate. The fly will utilize natural wounds, like the bloody umbilicus of a new-born calf or severe tick bites on a cow's ear and also man-made wounds such as saddle sores on horses, cuts and bites the result of dog-fights and even cuts and nicks received by animals from barbed wire. Humans are susceptible, and graphic examples given were alcoholics, the mentally handicapped and escaped convicts.

In March 1988, the fly became established in Libya in North Africa, and very quickly became a serious pest in the fertile farming country around Tripoli. Dr Hall was one of the team involved with attempting to control the insect in Africa where it threatened to become a major health problem for animals and humans alike.

Initial measures involved a major publicity campaign to enable local doctors and vets to identify the new fly distinguished by the dark longitudinal stripes on its thorax. Insecticides were applied by spraying animals, or direct to the infected wound in liquid or powder form.

The fly had been successfully eradicated from the USA (in 1957) and in 1990 Mexico was declared New World screw-worm free. The eradication in the USA and Mexico had been achieved using the sterile insect technique, in which the local population of normal flies is swamped by the mass release of reared flies which have been rendered sterile by irradiation. This technique was now put to use in North Africa. Flies were imported from a Mexican factory and released over 40 000 square miles of Libya and neighbouring Tunisia. At the height of the campaign, 40 million flies were released each week, totalling 1300 million flies overall. The last screw-worm case was reported on 7 April 1991, but release of sterile flies continued for nine more life-cycle times, to be sure of complete eradication.

In concluding his lecture, Dr Hall reflected that when he had first been approached to give a lecture to the Society, not one sterile fly had been sent across the Atlantic and the future of farming in Africa had been in the balance. He was pleased to be in the position of knowing that the scales had tipped in mankind's favour.

25 February 1992

The President, Mr A. J. HALSTEAD showed three insects associated with water lilies. *Galerucella nymphaea* (L.) (Coleoptera: Chrysomelidae) is a locally common pest of water lilies, *Nymphaea* spp., especially at RHS Garden, Wisley, where these specimens were taken on 7.vii.86. The larvae live on the upper surface of the leaves and eat irregularly linear slots in the leaf surface. The adults are present from late May to September, and also feed on the leaves and flowers.

Donacia crassipes F. (Coleoptera: Chrysomelidae), a relatively uncommon beetle was found on 13.vii.90, on leaves of the yellow water lily, *Nuphar lutea* L., near Puttle Bridge in the New Forest. The larvae feed on the underwater parts of the host plant.

Hydromyza livens (F.) (Diptera: Scathophagidae) was found sitting on yellow water lily leaves in company with the *Donacia*. It has larvae that feed as leaf miners in the lily pads and stalks.

The President announced that Mr M. J. Simmons had sent his apologies, but was unable to attend the meeting that evening, having just become a proud father. Mother and child were well.

The Secretary, Dr J. MUGGLETON, announced on behalf of Mr C. B. Ashby, that the London Natural History Society had extended its offer to BENHS members wishing to use the LNHS library housed in Imperial College. Those wishing to have access to the library could obtain an LNHS library card from Dr Muggleton.

The ordinary meeting was then followed by the Annual General Meeting.

Minutes of the Annual General Meeting of the Society held at the rooms of the Royal Entomological Society of London at 6.30 p.m. Chairman: The President, Mr A. J. Halstead. Present: 34 members.

Minutes of the last Annual General Meeting were read and signed.

The Secretary read the Council's report, followed by the Treasurer who read his report. The Editor, Librarian and Curator then read their reports and Dr M. Scoble read the report of the Hering Memorial Research Fund. The Treasurer invited questions on his report. Mr R. A. Softly noted the apparent increase in income from dividends which was large compared with the previous year. The Treasurer replied that this apparent increase was due to the change in the way the accounts were presented this year. Mr P. J. Baker said that the bank charges appeared to be very high and asked if a change to another bank might be appropriate. The Treasurer replied that he was investigating this. The President proposed the adoption of the reports, this was seconded by Mr D. Young and passed unopposed. (See pages 168-175.)

The President then read the names of the Officers and Members of Council recommended by the Council for 1992-93 and, as no other names had been submitted, he declared the following duly elected. President: Dr J. Muggleton; Vice-Presidents: A. J. Halstead, Dr D. Lonsdale; Treasurer: A. J. Pickles; Secretary: R. F. McCormick; Editor: R. A. Jones; Curator: P. J. Chandler; Librarian: S. R. Miles; Lanternist: M. J. Simmons; Ordinary Members of the Council: P. J. Baker, M. R. Brown, G. N. Burton, G. A. Collins, R. Dyke, Mrs F. M. Murphy, R. Norledge, C. W. Plant and M. J. Sterling.

The Secretary then read Bye-law 22(d) and invited motions or questions. There was none.

The President then read his report and gave his address.

The President then installed the new President, Dr J. Muggleton.

The President proposed a vote of thanks to the retiring President, and this was seconded by Mr G. A. Collins. The President asked for permission to publish the Presidential Address, this was given. (See pages 37-47.)

Mr A. Stubbs gave a vote of thanks to the retiring Officers and Council.

Auditors: The President proposed the election of Mr R. A. Bell and Col. D. H. Sterling as Auditors for the coming year, this was seconded by Mr R. W. J. Uffen and Mr R. A. Jones, and passed unopposed.

10 March 1992

The President, Dr. J. MUGGLETON, announced the deaths of two members, Mr J. A. C. Greenwood, who joined the Society in 1958, and Mr L. A. Cram, who joined the Society in 1991.

Mr R. A. JONES showed two specimens of *Leucozona (Ischyosyrphus) laternaria* Muller (Diptera: Syrphidae), a normal specimen showing the pale yellow spots on tergite 2, and an aberrant specimen without these yellow spots, but with only a dusting of grey hairs, taken on 4.viii.91 at Westerham, Kent.

Mr R. A. SOFTLY showed a specimen of the 24-spot ladybird, *Subcoccinella vigintiquattuorpunctata* L., which he had found in his light trap. The beetle must have crawled in, because it is a flightless species.

Mr Softly also showed the twin-spotted quaker, *Orthosia munda* (D. & S.) which had emerged that day from a larva collected from a spun sawfly shoot.

Mr R. K. A. MORRIS showed copies of two recent publications from the Joint Nature Conservation Committee: *Classification and ranking of water beetle communities in Britain*, and *A review of the scarce and threatened Hemiptera of Great Britain*.

The names of J. D. Caldwell, D. J. Gibbs and K. S. Powell were read for the second time and they were duly elected members of the Society. Mr T. J. James signed the obligations book.

Mr J. R. DOBSON asked whether any members had had any experience with CO₂ dispensers used to anaesthetize insects. Originally designed to remove corks from wine bottles, they were no longer manufactured. Entomologists have used them to squirt a dose of carbon dioxide into a tube containing live insects. The insects were immediately knocked down, and could be examined under a lens, before they recovered a short while later. Mr Dobson had approached the manufacturers, BOC, who had expressed an interest in making a limited number of the dispensers if there was enough interest. They would retail for about £15, and could be recharged with commercially available 'sparklet' CO₂ bulbs.

Dr Muggleton reported finding a male *Orthosia gothica* (L.) in his light trap in Staines on 22.ii.92, and wondered if this were an early date.

Mr Softly reported that he too had found this moth, in March, and Mr M. J. SIMMONS had received a report of this species occurring on 13.ii.92.

Dr D. LONSDALE spoke on a major problem for invertebrates—'The fatal gap: habitat isolation and its implications for insect conservation'. Most people are aware of the very great total area of habitat lost in this country, but the effect of this loss on the insect fauna has been compounded by the relative isolation of the remaining pockets of habitat.

If an insect becomes extinct in a small remaining habitat, the chances of it becoming re-established by recolonization from a neighbouring colony become very slight, the more isolated the initial site is. By examining various examples, Dr Lonsdale illustrated how isolation of a habitat can come about, and the effect such isolation can have on insect populations.

The heath fritillary occurs in woodland clearings, and must constantly colonize new clearings, as old clearings become shrubby and shaded. If the butterfly is to survive in a woodland, the wood must be large enough to supply a constant succession of these temporary and transient niches.

Another example of a constantly shifting habitat is river shingle. Insects occurring here need to shift with the shifting sand and pebbles. If the system is disrupted, distances between the remaining suitable shingle banks may become too great to allow movement of a species from one site to another.

A patch of flowery downland may be isolated from other similar downs by a surrounding 'ocean' of arable land. The corn fields act as an almost impervious barrier to the passage of would-be colonizers.

Thus, if an insect species is to have the best chance of survival, it needs a continuity of habitat both temporally and spatially.

Dr Lonsdale particularly blamed roads for fragmenting the countryside and he considered the whole country as a series of islands isolated by linear barriers. Although verges could act as corridors for the movement of insects along roads, passage across a road was more than just a short journey for an insect, buffeted as it would be by eddies above the desolate centre of the carriageways. Roads brought further problems in the form of exhaust pollution and changes in local drainage.

Most insects in danger of extinction in this country are perhaps at the very edge of their range, a range defined by the climate. Appropriate sites in Britain are therefore microsites, and are much more strictly defined than the same insect's habitat range on the Continent. It therefore becomes much more important that insects living in such sites are able to reach other similar sites.

It has been suggested that warm niches, such as sunny man-made clearings in woods became refuges for some insect species after the climatic cooling from higher temperatures 5000 years ago. By becoming adapted to these rather limited sites, insects lost the ability to move greater distances. Some, admittedly rather controversial, work had shown that over the last few hundred years butterflies like the large blue have shown a degeneration in thoracic size, and hence musculature, in relation to wing size, perhaps demonstrating a weakening of the ability to fly any distance.

Sudden and great changes in land use threaten to break up the British countryside into a dwindling series of declining islands. Dr Lonsdale urged that if we are to succeed in maintaining a varied flora and fauna in this country there will have to be changes to national and local policy, to encourage forestry and agriculture to bridge the gaps between the islands, to create and maintain habitats not just in nature reserves, but also in the general countryside.

After the lecture there was a long discussion on improving the countryside, by restoring features like hedges and 'unimproved' land. It was generally agreed that this was a good thing in its own right, not just as a means of creating habitats and corridors for the safe passage of insects and other animals, but because we cherish the landscape that results.

24 March 1992

The President, Dr J. MUGGLETON, showed a male of the Indian stick insect, *Carausius morosus* (Sinety), and a female for comparison. This commonly reared stick insect is parthenogenetic and males are very rare in culture (their frequency in the wild is not known). The male is smaller and much slimmer than the female and has a red coloration to the ventral surface of the thorax. The exhibitor's present culture has produced one or two males per generation for the last three or four generations; no matings have been observed.

Mr A. J. HALSTEAD showed a very pale form of the hebrew character moth, *Orthosia gothica* L., a male, together with a typical specimen for comparison. Only the blackish markings of the forewings had retained their usual colour. The specimen was taken at a Rothamsted light trap at RHS Garden, Wisley, Surrey on 4.iii.92.

Mr R. A. JONES showed two superficially similar yet quite distinctive species of dung beetle (Coleoptera: Scarabaeidae). *Aphodius equestris* (Panz.) was previously (1890s) regarded as rather rare, but is now widespread and quite common. Conversely, *Aphodius distinctus* (Müller, O. F.) was regarded as common, but is now rare. Two specimens of the latter species were found at Butley, Suffolk, 20.iii.92, in dog dung.

Dr J. S. BADMIN showed an unidentified slug found on a bunch of bananas. It was dorso-ventrally flattened, but with a very narrow foot underneath. The bananas on which it was found came from the Windward Islands.

The names of R. Boyce, R. G. Cave, R. E. Hill, N. J. Riddiford and A. M. Riley were read for the second time and these persons were duly elected as members of the society. Mr D. Marshall signed the obligations book.

Dr J. BADMIN spoke on 'Leafhopper lifestyles' and after an introduction to the various groups of the Homoptera considered the contribution to be made to their ecology by long-term population studies.

Many species are polymorphic, the common 'spittle bug' *Philaenus spumarius* (L.), having 11 well-known colour forms. *Aphrophora alni* (Fall.) has a different colour form occurring on bog myrtle which is genetically determined, and varies between patches of its foodplant.

The common froghopper *Cercopis vulnerata* Ill., has a 'yellow' or white form, which Dr Badmin had studied in three colonies in the Isle of Sheppey. His observation that most specimens seemed to occur along footpaths, led him to study the populations of 'yellow' and red forms using the footpaths as transects. During periods of high numbers, the 'yellow' form made up about 4% of the population, but after the populations peaked in 1987/1988 there was a population crash and the 'yellow' form has not occurred since.

Dr Badmin had also made a particular study of *Graphocephala fennahi* Young, an introduced species, originally from North America which has become quite widespread on rhododendrons. The eggs are laid inside the flower buds, and their presence is betrayed by the scars left after oviposition. Even though most flowers are high up on the plants, up to 4 m, most eggs are laid in the lower flowers. The numbers of eggs laid in the buds increase as bud size increases. As the surrounding coppice grows, the lower rhododendron flowers are shaded out, thus *Graphocephala* seems to favour the early part of the coppice cycle.

On the other hand, *Issus coleoptratus* (F.) seems to favour later stages in the coppice cycle, although it is not known why.

Dr Badmin concluded that these interesting insects are of great economic and ecological importance, and at the same time are easy to study.

14 April 1992

The President, Dr J. MUGGLETON, announced the death of Mr K. G. W. Evans, who joined the Society in 1969, and who had organized the Society's Annual Exhibitions for many years.

The President showed scanning electron micrographs (Figures 1 and 2) of the bee mite *Varroa jacobsoni* Oudemans. This mite parasitizes honeybees and originated from East and South-East Asia where it is common on *Apis cerana* F. It has subsequently spread from Asia into Europe largely as a result of the movement of bees by man. In Europe it is found on *Apis mellifera* L. Until the previous week the British Isles was believed to be free from *Varroa*, however the presence of this mite in an apiary in South Devon was confirmed on 6 April and other apiaries in the area were subsequently found to be infested. This mite is regarded as a serious threat to the bee industry as it can severely weaken bee colonies.

Mr R. A. JONES showed three slides taken in Florida, USA in December 1991. They showed a crane fly (Diptera: Tipulidae) resting on the orb web of a small spider. Several groups of tipulid flies are known to exhibit this behaviour.

Mr D. J. L. AGASSIZ showed two live adults of *Phyllonorycter platani* (Staud.).

Mr E. BRADFORD showed a specimen of *Eulamprotes phaeella* Heckford & Langmaid taken at actinic light on 24.viii.89. The foodplant is unknown, but possibly *Hypericum* spp.

He also showed a specimen of *Monochroa hornigi* (Staud.) taken at light on 2.vii.91. The larvae mine the stems of *Polygonum* spp.

The name of Roger A. Jones was read for the second time and he was duly elected a member of the Society.

Mr D. J. L. AGASSIZ spoke on 'The invasion of *Phyllonorycter leucographella* and other Lepidoptera'. This leaf-mining moth was first discovered in Wickford, Essex, in 1989, mining the leaves of pyracantha bushes. Examination of pyracantha bushes in Essex showed that it occurred commonly, within a large but discrete area. Each year it has expanded its carefully monitored range.



Fig. 1. *Varroa jacobsoni*. The scale bar represents 400 μ m (0.4 mm). Photo MAFF.

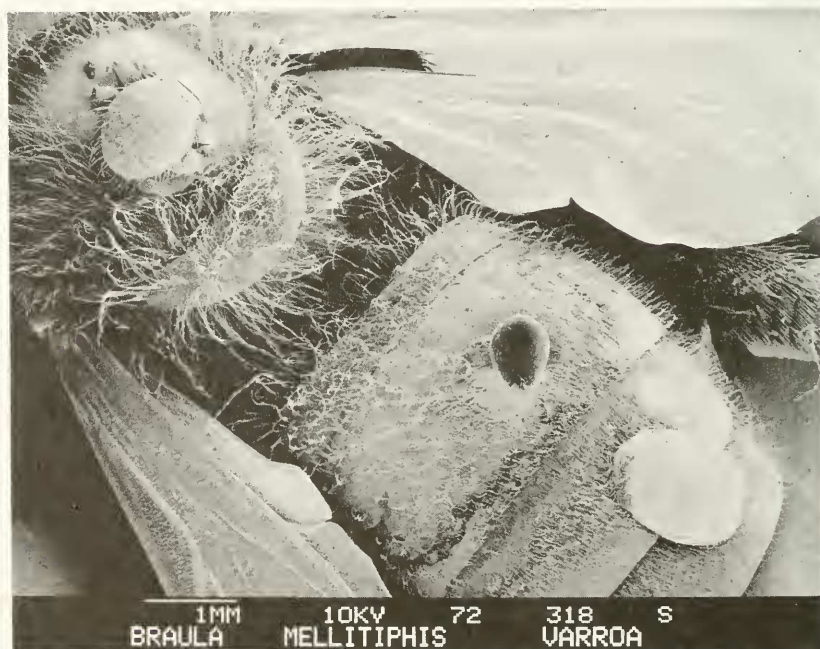


Fig. 2. Three honeybee parasites, from left to right: the bee louse, *Braula coeca* Nitzsch (Diptera: Braulidae); *Mellitiphis* another mite, and *Varroa*. Photo MAFF.

The moth's caterpillar creates a characteristic mine along the midrib of a pyracantha leaf. This eventually increases to become a large blister covering most of the leaf and eventually the leaf withers and curls forming a pod. The presence of the leaf mines is obvious, and examination of bushes often shows that 90% of leaves are affected.

The most simple model of the expansion of a species is a diffusion model, with expansion outwards of an ever increasing circle. If the spread outwards along the radius is uniform, a plot of time against the square root of the expansion area is a straight line. The data for *P. leucographella* showed an almost exact straight line. By extrapolating backwards in time to the point of zero area, a guess can be made as to the arrival of the insect, in this case 1987.

By examining the published records of other 'invading' moth species, it was possible to show parallels with, as well as differences from, the invasion of *P. leucographella*.

Many newly arrived species feed on garden plants that are widely grown, and have been able to establish themselves in Britain quite easily. One example is *Thera cupressata* Gey. Its foodplant, cypress, is a native of the Mediterranean area. The tree has been planted up the Atlantic coast of Spain and France, and the moth has followed up the Bay of Biscay and across the Channel.

P. leucographella and *P. platani* arrived into south-east England, but some, like *Paracystola acroxantha* Meyr. arrived into the south-west. *Acleris abietana* Hübn. arrived into Scotland and has since spread southwards as far as Northumberland. This species may have been an accidental importation rather than arriving here on its own steam.

Most species spread naturally once they arrive, but some, like *P. leucographella*, are likely to be moved by man, especially through the garden trade. *Cacoecimorpha pronubana* is mainly a greenhouse insect, and is spread through the movement of plants. A simple diffusion model is inappropriate to study its spread.

Study of several species showed that irrespective of body mass, expansion took place at a rate of about 5–10 km per year.

By observing the spread of *Phyllonorycter leucographella*, a relatively harmless moth species, it is hoped to gain some insights into the way potential pest species might spread, if they accidentally became established in Britain.

SHORT COMMUNICATION

Ectobius lapponicus (L.) (Dictyoptera: Blattidae) discovered in Gloucestershire.—The dusky cockroach (*Ectobius lapponicus*) was swept by myself and Dave Clements in good numbers from an area of tussocky *Deschampsia cespitosa* (L.) and rushes (*Juncus* sp.) at Foxes Bridge Marsh (SO 630125) in the Forest of Dean, W. Glos., on 17.vi.1990. The marsh is developed in a small depression in the Dean coal measures, where overlying alluvium and a stream create an acid mire—a rare habitat in the county. The site is surrounded by mature oak woodland which provides good shelter. The cockroach was present in every sweep of our nets in the drier parts of the marsh. Its discovery in the county was quite unexpected; the nearest modern sites are many kilometres away to the south, although there is an old record from Warwickshire to the north (Marshall & Haes, 1988).—K. N. A. Alexander, 22 Cecily Hill, Cirencester, Gloucestershire, GL7 2EF.

REFERENCE

Marshall, J. A. & Haes, E. C. M. 1988. *Grasshoppers and allied insects of Great Britain and Ireland*. Colchester: Harley Books.